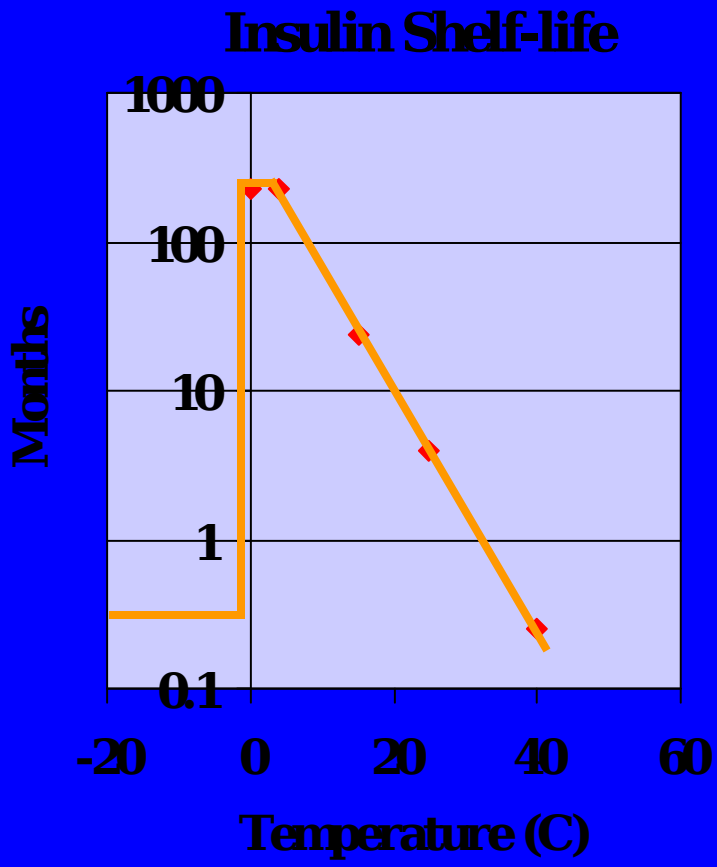
The CliniSense LifeTrack™ shelf-life monitor

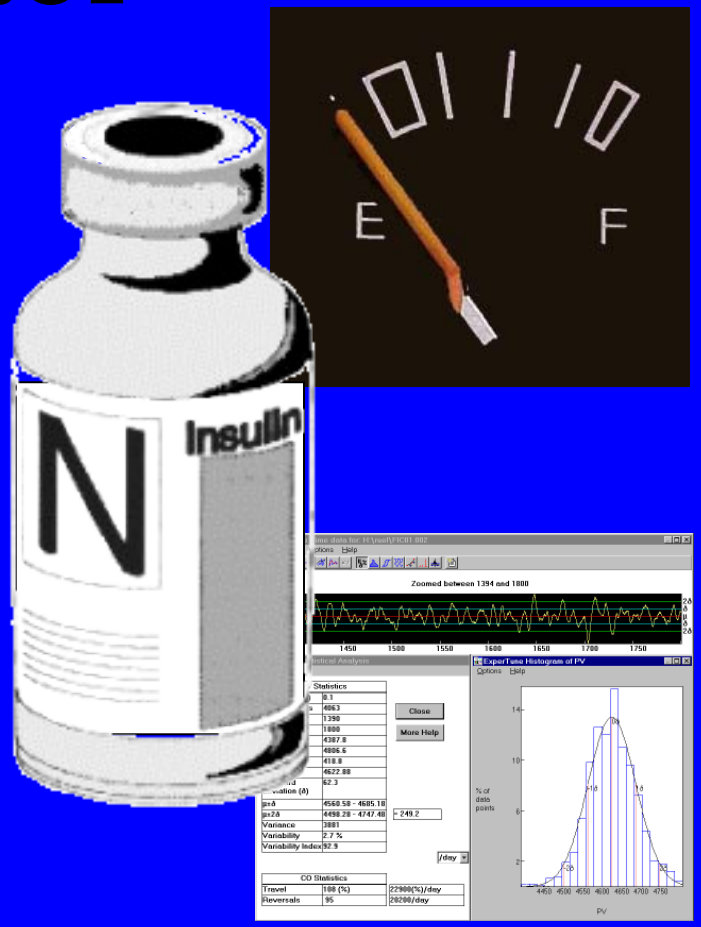
Shelf Life Issues

- Shelf life is determined by both time and temperature
- Most materials deteriorate faster at high temperatures
- Some materials “die quickly” at temperature extremes



The ideal shelf-life monitor

- Is accurate
- Immediately tells if the product is still good
- Has a “gas gauge” to show remaining shelf life
- Can provide a detailed product history record upon request



The CliniSense LifeTrack™

- Monitors and analyzes temperature history
- Programmed with a material's sensitivity curve
- Displays remaining shelf-life
- Downloads data to a computer

The LifeTrack unit

+/- good bad displa y

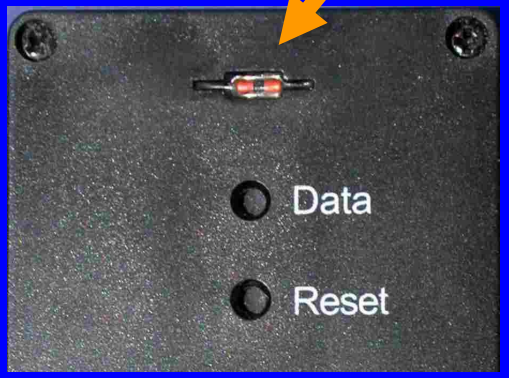
Lifetime bar

Battery door

Infrared LED

Programming & expansion Port

Thermistor

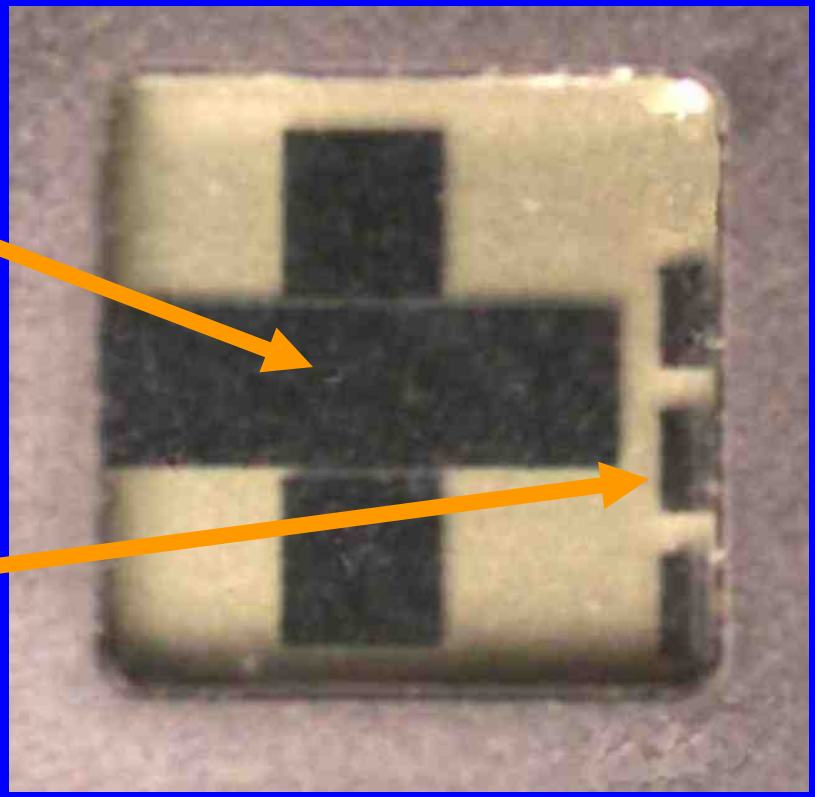


Battery (3 yr life)

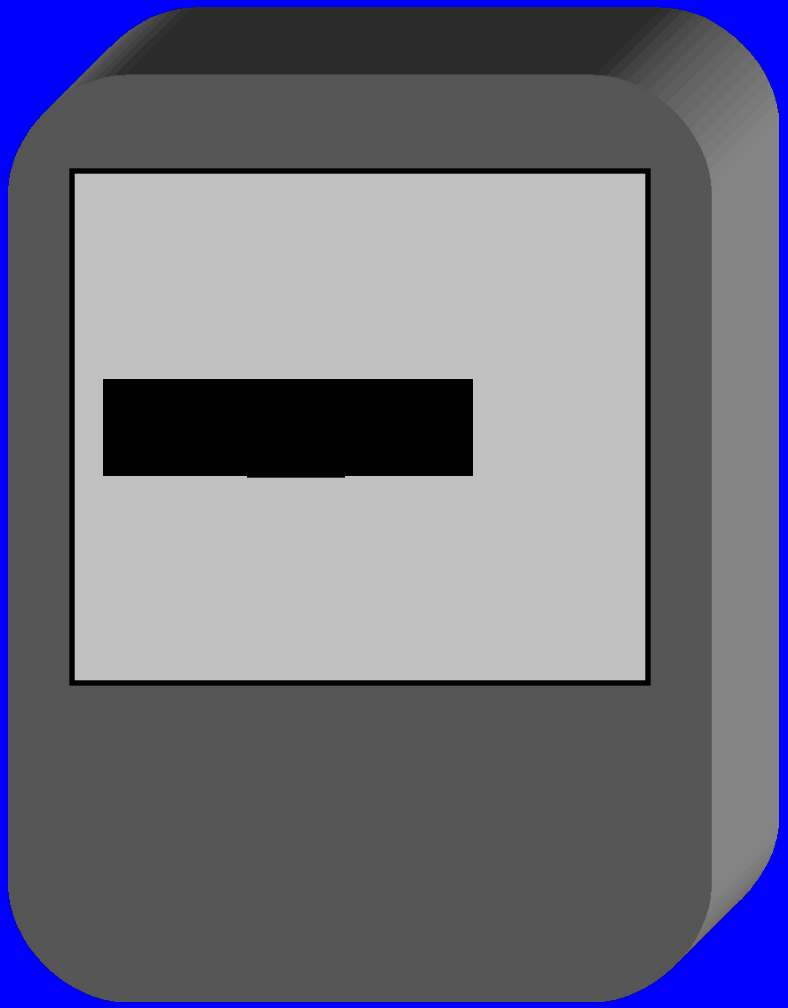
US & foreign patents pending

LifeTrack Display

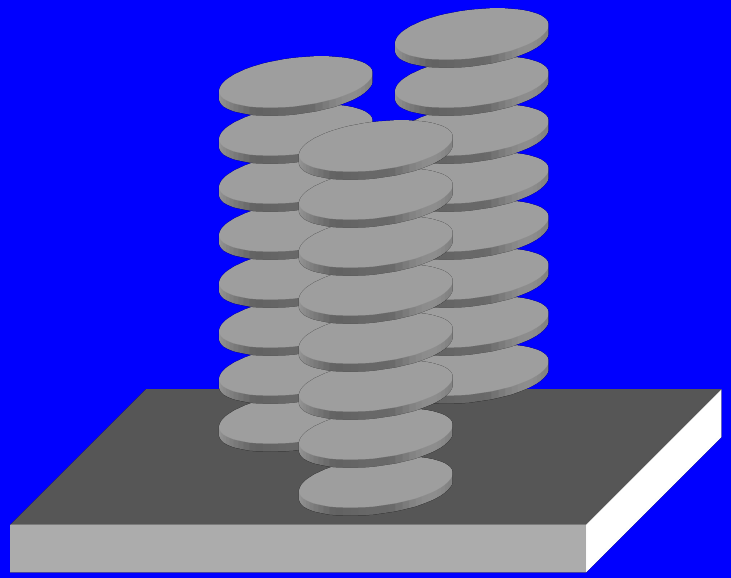
- Shows “+” when product is good, “-” when product has expired
- Lifetime indicator bars decrease as the lifetime is used up



Display in action



The stability bank algorithm



Stability bank "B"

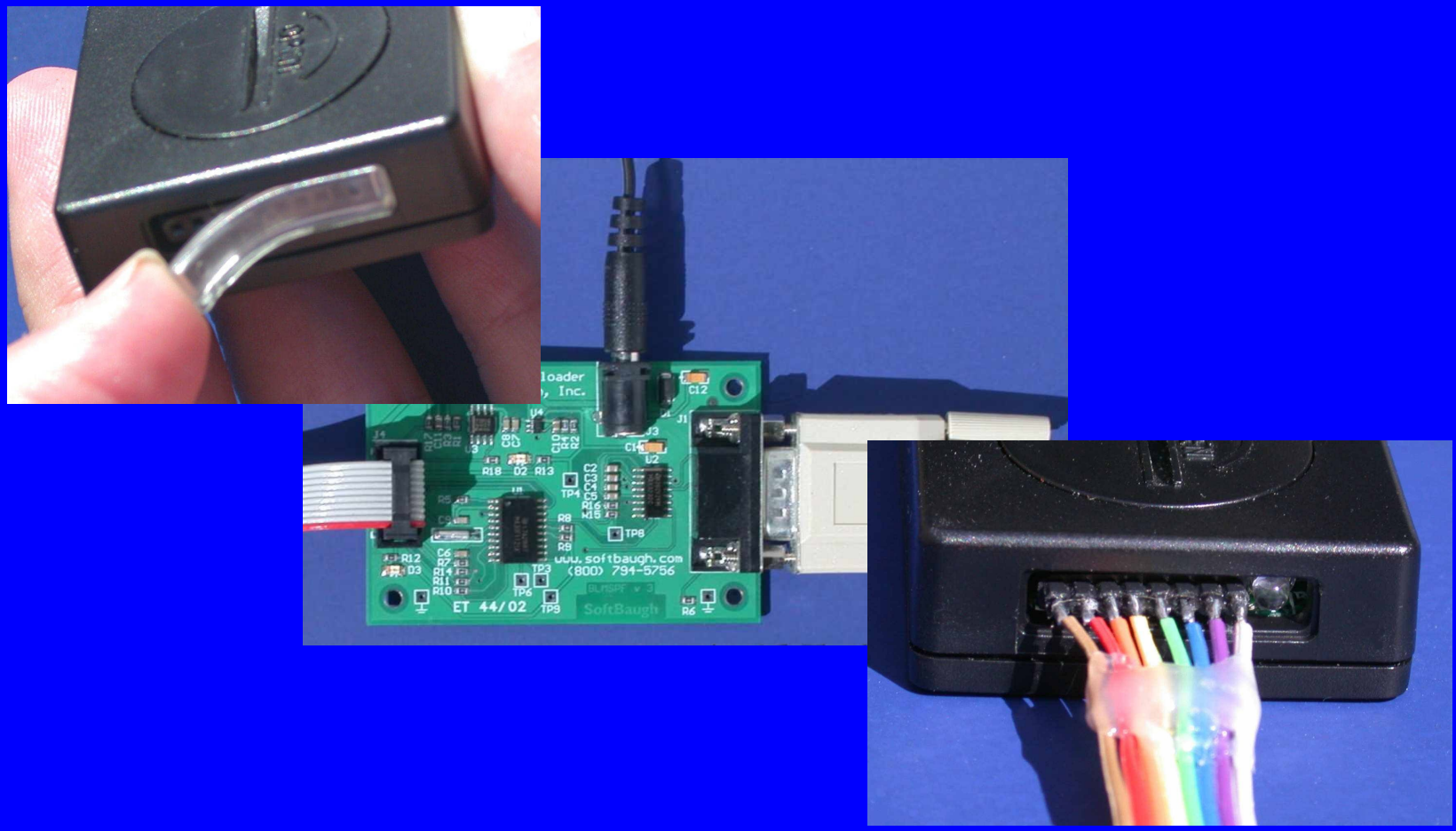
Low temperature

Small # of withdrawals per hour

High temperature

High # of withdrawals per hour

Programming a LifeTrack



1: Find time-temperature data

TYPE Milbond Adhesive System

Milbond is an elastomeric-epoxy adhesive system for most glass to metal bonding applications. Milbond kits include an adequate quantity of spacer materials requested by the Military to maintain a bond layer thickness of .015" (.38mm). Milbond meets Military specification MIL-A-48611. Milbond can also be used in glass to glass, glass to plastic, metal to plastic, and metal to metal bonding.

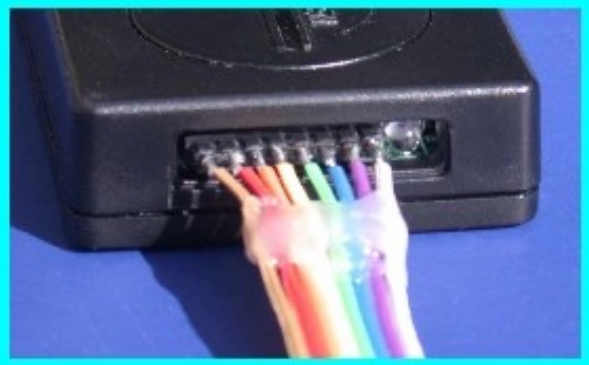
Approximate Curing Times

Mix Ratio	Room Temperature 25°C (77°F)	Oven Temperature 71°C (160°F)
Epoxy 1:1 (by weight)	7 days	3 hours
Primer 1:1 (by volume)	1 hour (to touch) 24 hours (to dry)	Not Recommended

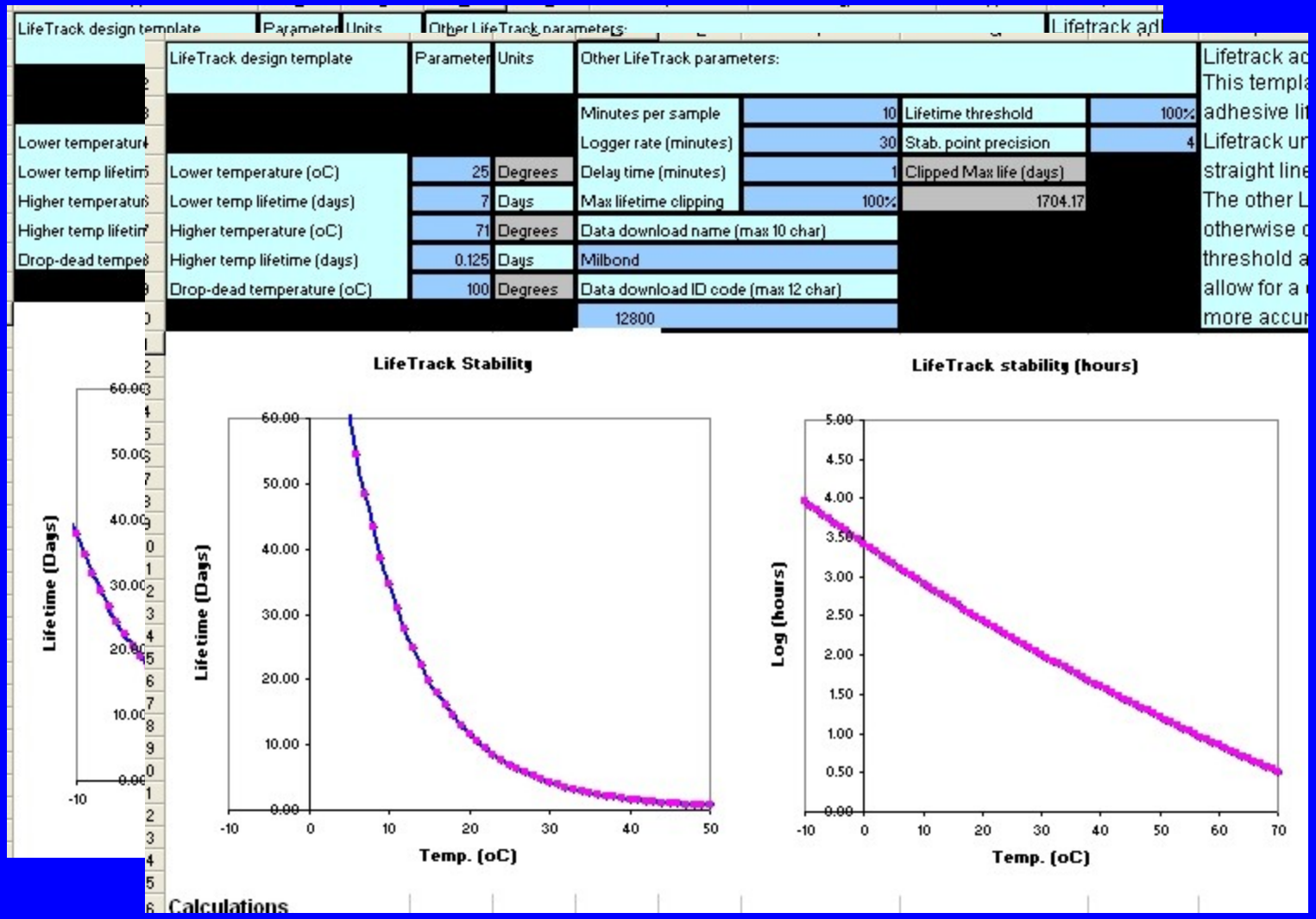
2: Download LifeTrack spreadsheet

LifeTrack File Downloads

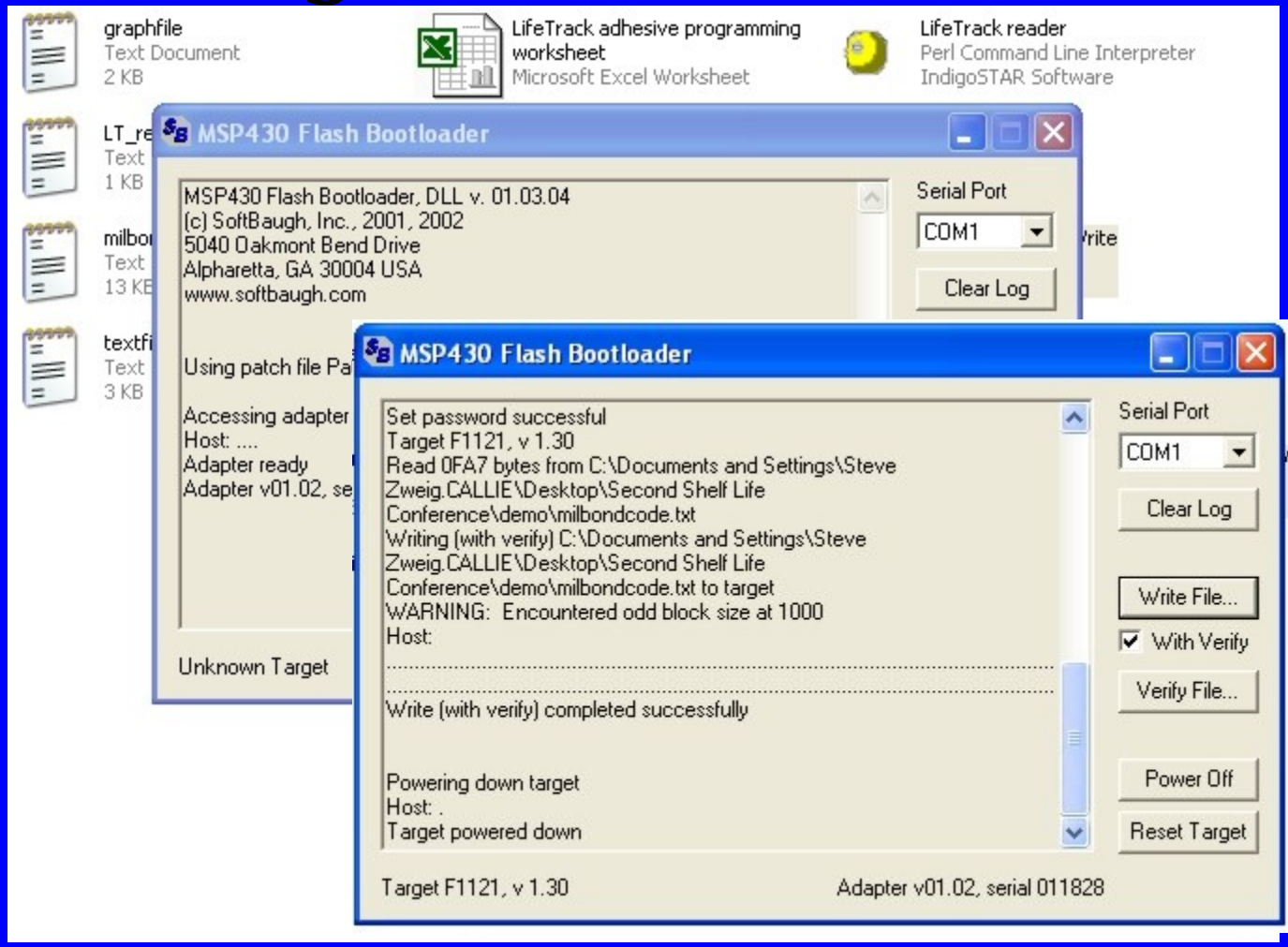
To download, right click and select the "Save Target As..." option

	Instructions	Software
	 LifeTrack programming interface	**Programming spreadsheets** 4 parameter (freezing refrigerated, room-temp, drop-dead temp) model 5 parameter (freezing, refrigerated, room-temp-1, elevated temp-2, drop-dead temp) model Adhesive curing model

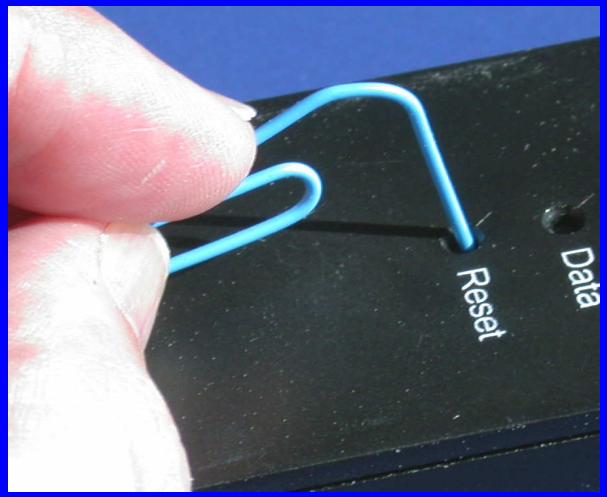
3: Enter data in spreadsheet



4: Program LifeTrack unit



Programming complete



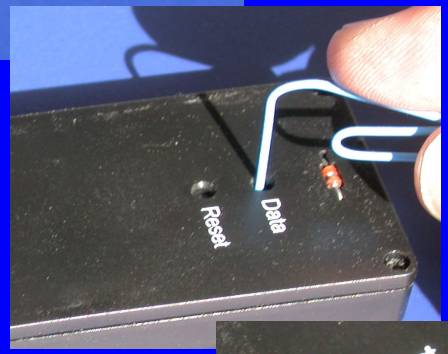
Reset the unit,
QC test, and use

Applications

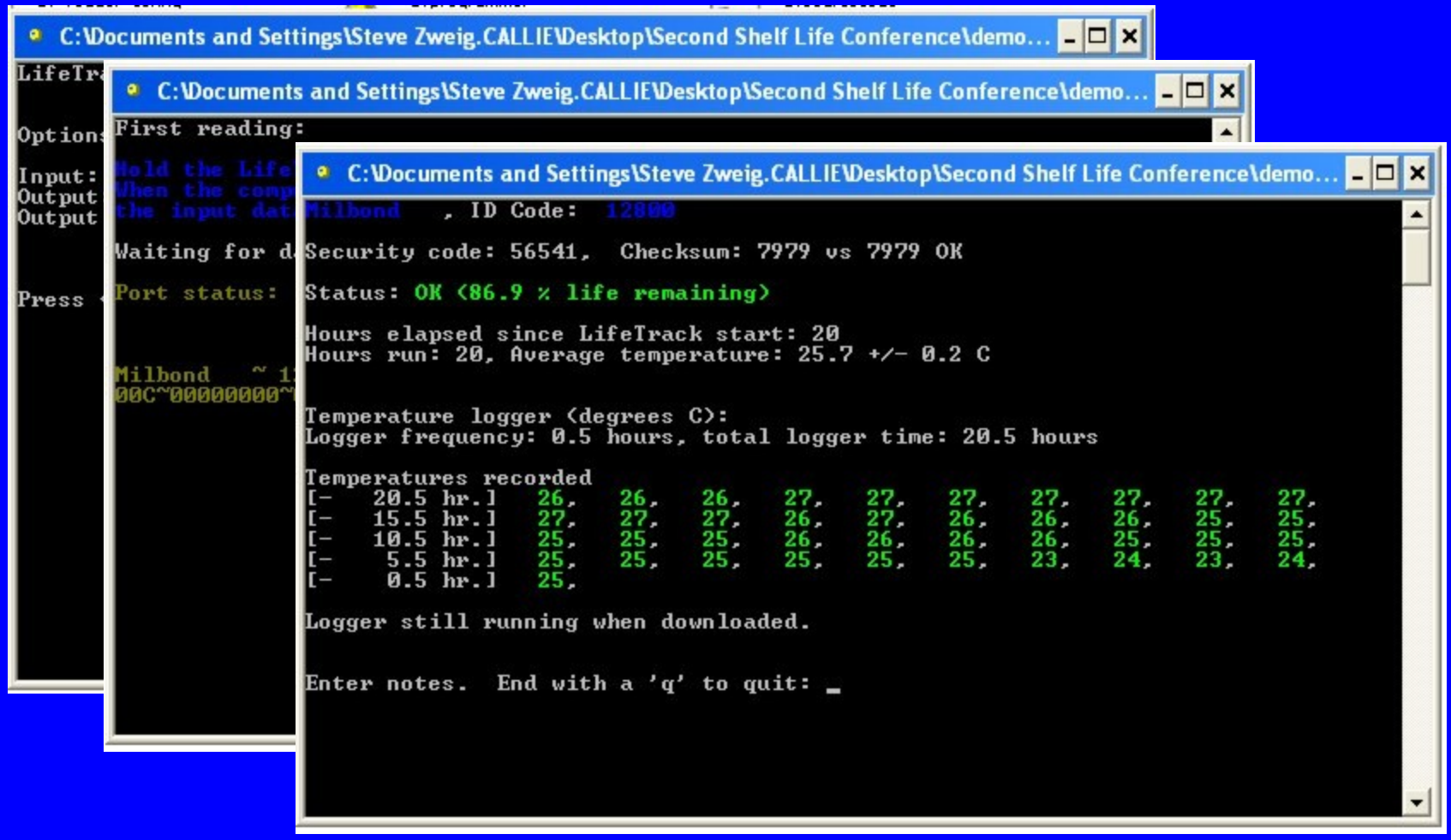
- Algorithm can track stability ranging from “ice cream” to “rubber tires”
- Medical products & drugs
- Biodefense Diagnostics
- Food
- Chemicals
- Temperature sensitive rubber and plastics

Data transmission (standard unit)

- Infrared link to Optical RS232 cable
- Compatible with Windows & Linux
- Can be interpreted on the spot or directed to a remote web site
- “Open system” users can control data & applications



Data playback

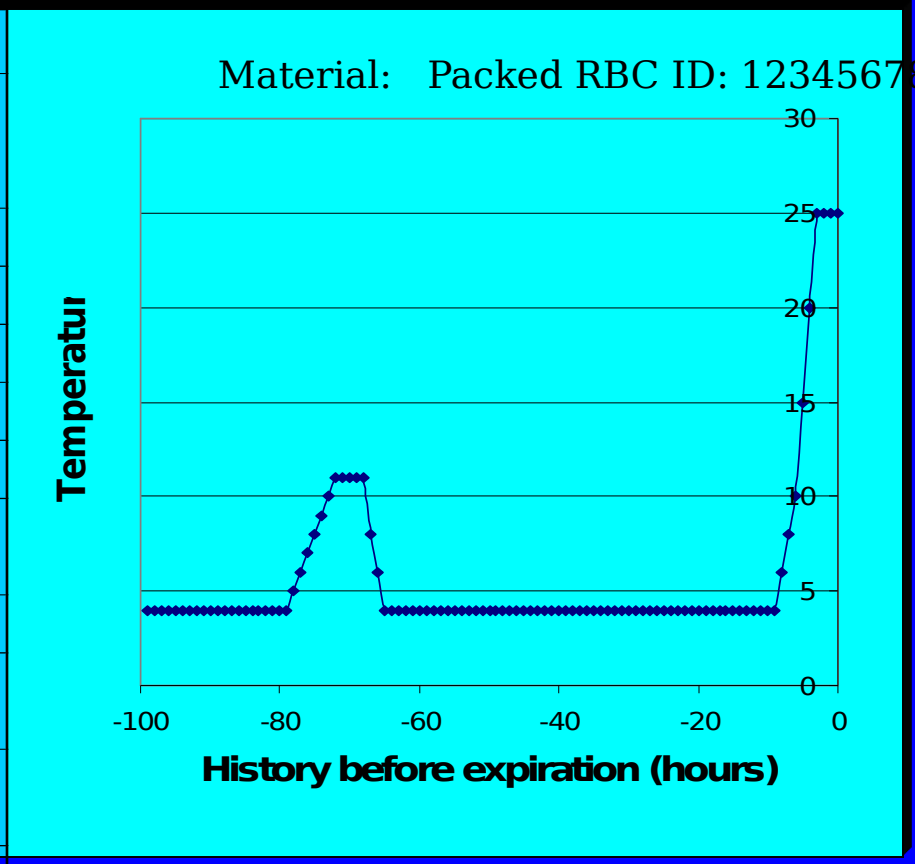


Output data includes

- ID name and ID code
- Unique security code that changes on reset
- Time unit has been running
- Time since unit expired
- Temperature statistics
- Pre-expiration temperature log (50 hours to 400 days).

Data output example

Statistics	
Product Name	**http://www.lifetrack.mil/army/Packed RBC**
Product ID	**ABCDE123456789**
Status	**Expired**
Security code	**OK**
Hours elapsed	**130**
Hours since expired	**30**
Avg. PreExp temp	**5.85 °C**
Standard deviation	**4.72 °C**
Avg. PostExp temp	**25 °C**



Example: Evaluation at Walter Reed

- Blood storage life depends greatly on temperature
- Often shipment conditions are not ideal
- LifeTrack units may help distinguish properly shipped blood from improperly shipped blood.
- Victor MacDonald, M.D., Chief of Blood Storage Branch is presently evaluating various LifeTrack blood storage programs

Cost and availability

- Cost: $20 per unit
- Availability: In production, available now

CliniSense Contact Information

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